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PROSTHECHEA MADRENSIS, A RECONSIDERATION OF *EPIDENDRUM MADRENSE* SCHLTR. (ORCHIDACEAE: LAELIINAE)

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ABSTRACT

Epidendrum madrense, traditionally treated under the synonymy of *Prosthechea chacaoensis*, is recognized as a distinct species and transferred to *Prosthechea*. The number, length, and shape of the nectar guides on the labellum are useful taxonomic characters to distinguish closely related species in *Prosthechea*.

Key words: Laeliinae, Mesoamerica, Orchidaceae, *Prosthechea madrensis.*

RESUMEN

Epidendrum madrense, tratada tradicionalmente como un sinónimo de *Prosthechea chacaoensis*, es reconocida como una especie distinta y se transfiere al género *Prosthechea*. El tamaño, la forma y el número de las guías nectaríferas del labelo son caracteres útiles para distinguir entre especies cercanas en el género *Prosthechea*.

Palabras clave: Laeliinae, Mesoamérica, Orchidaceae, *Prosthechea madrensis.*

RECONSIDERING A LONG UNUSED NAME. While trying to clarify the identities of *Prosthechea ionophlebia* (Rchb.f.) W.E. Higgins and *P. chacaoensis* (Rchb.f.) W.E. Higgins (Pupulin & Karremans, 2007) some uncertainty arose about the determination of a plant from Nicaragua, which from a photographic record seemed to show some intermediate characteristics of both species. Later the opportunity of

studying living material of a Nicaraguan *Prosthechea* related to *P. chacaoensis* presented itself. The Nicaraguan specimen did not fully fit any of the names previously used for Mesoamerican *Prosthechea* populations, with the possible exception of the Mexican *Epidendrum madrense* Schltr.

Epidendrum madrense was originally collected by Eugène Langlassé in the Sierra Madre, Mexico, in 1877. The holotype was ostensibly destroyed by fire in 1943, together with Schlechter's analytical drawings (Ames, 1944). However, a tracing of the drawing of the type is conserved at the Oakes Ames Orchid Herbarium, Harvard University Herbaria (http://ids.lib.harvard.edu/ids/view/5783597) reporduced here as Fig. 1. In the drawing of the type, the flower shows very narrow sepals and petals and a short lip with few and short nectar guides, quite dissimilar from the Nicaraguan specimen studied. However, it was evident that plants with the same characteristics are quite common and widespread in northern Mesoamerica, as illustrations of this taxon appeared in different treatments of the orchid floras of Nicaragua, El Salvador, and Mexico (Hamer, 1974, 1982; Hágsater et. al., 2005). Miguel Ángel Soto Arenas kindly provided a drawing of a Mexican plant from Oaxaca, suggesting its name was *E. madrense*. The study of the type material kept at the herbarium of the National Museum of Natural History of Paris (P), allowed me to conclude that the plant ranging from Mexico to Nicaragua, and traditionally buried under synonymy of *P. chacaoensis*, is in fact a distinct species, corresponding to the *Epidendrum madrense* described by Schlechter, still in need of a combination in *Prosthechea*.

Prosthechea madrensis (Schltr.) Karremans, comb. nov.

Basionym: *Epidendrum madrense* Schltr., Beih. Bot. Centralbl. 36(2): 405 (1918). TYPE: Mexico: Sierra Madre, 1000 m. Apr. 1899, *Langlassé 1000 bis* (holotype, B, destroyed; isotypes, P 00407406!, P 00407407!; drawing of the holotype, AMES!). Figs. 2 and 3.

Plant epiphytic, pseudobulbous, erect, with a short rhizome. Roots flexuous. Pseudobulbs ovoid-elliptic, to 5 cm long, about 2.5 cm wide, diphyllous. Leaf leathery, sessile, elliptic to elliptic-oblong, to 15 cm long, 2 cm wide, acute. Inflorescence a raceme shorter than leaves, 1-4 flowered. Ovary pedicellate, triquetrous. Flowers not spreading completely; sepals and petals white, petals with a 1 mm long stripe at the base, the lip white, with 13 purple stripes, the three medium ones not reaching the lip apex, the middle one reaching half length between callus apex and lip apex, callus white. Dorsal sepal elliptic, spreading, acute, 17 x 6 mm. Lateral sepals obliquely ellip-

Fig. 1. Drawing of the holotype of *Epidendrum madrense* made under the supervision of R. Schlechter (AMES). Courtesy of the Orchid Herbarium of Oakes Ames, Harvard University Herbaria.

Fig. 2. Isotype of *Epidendrum madrense* (P 00407406), kept at the Muséum National d'Histoire Naturelle in Paris. Reproduced under the kind permission of the MNHN.

Fig. 3. Isotype of *Epidendrum madrense* (P 00407407), kept at the Muséum National d'Histoire Naturelle in Paris. Reproduced under the kind permission of the MNHN.

tic, acute, 17 x 6 mm. Petals obliquely elliptic, acute, 16 x 6-7 mm. Lip adnate to the basal third of the column, widely ovate, acute, with slightly undulate margins, slightly reflexed above the middle, 15-16 x 15-16 mm, callus 5 mm long and 2-3 mm wide, hairy. Column short, stout, about 7 mm long, three-toothed, with the mid-tooth half the length of the lateral teeth, with a triangular ligula under the mid-tooth and shorter than it. Anther cap, oblong, 4-celled. Pollinia 4, pyriform, complanate (Fig. 4) .

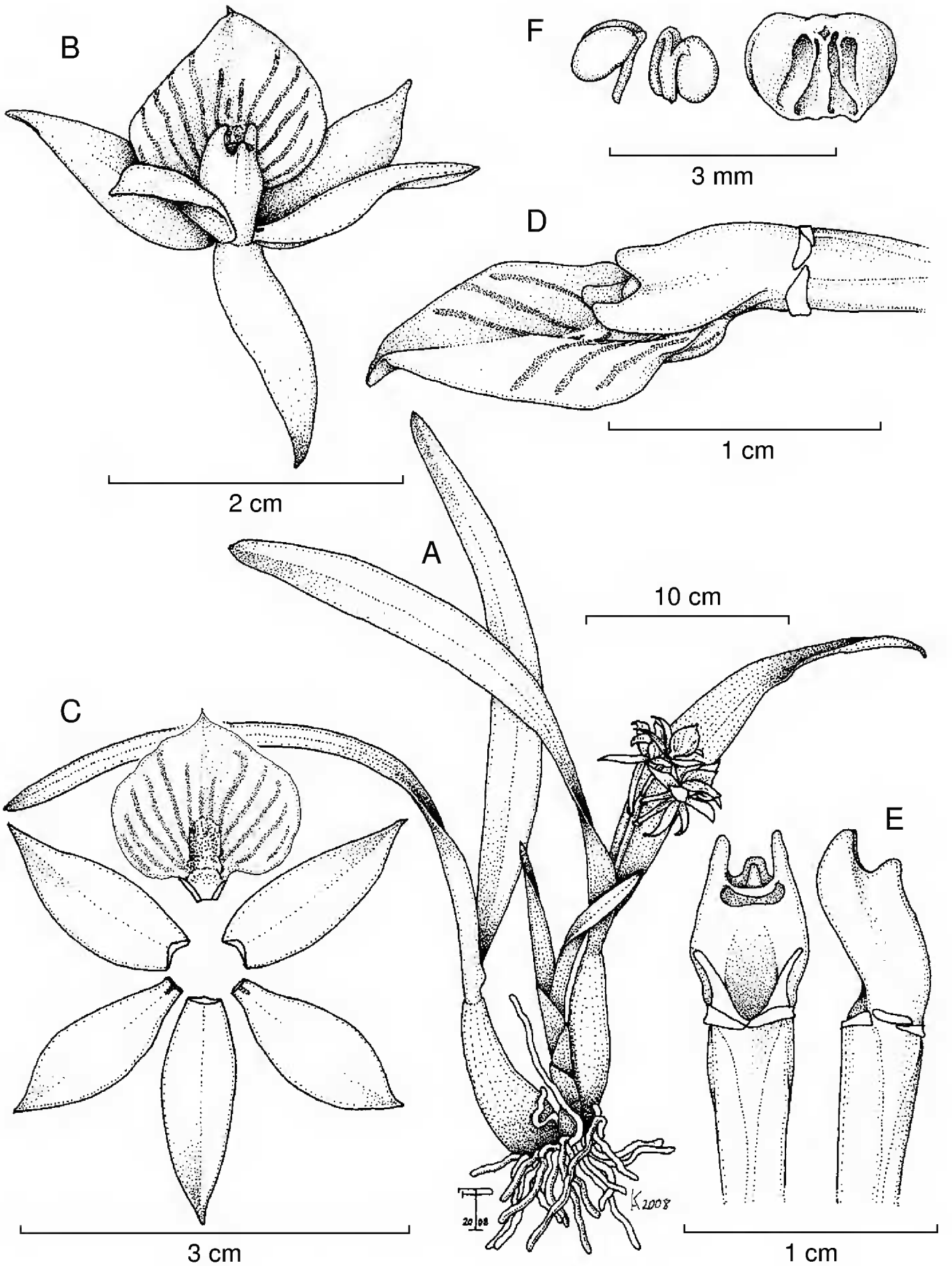

Fig. 4. *Prosthechea madrensis*. A. habit; B. flower; C. dissected perianth; D. column and lip, lateral view; E. column, ventral and lateral views; F. pollinarium (two views) and anther cap. Drawn by F. Pupulin & A. Karremans from *Karremans 1512* (JBL-Spirit).

Amongst the species of the *Prosthechea*, *P. madrensis* is most similar to *P. chacaoensis*, from which it differs by the ovoid-elliptic vs. pyriform pseudobulbs, the slightly vs. strongly concave lip (column visible in the former and covered by the margins of the lip in lateral view in the latter), the spreading, slightly bent vs. strongly reflexed petals, the midlines of lip truncate vs. continuous, the petals marked basally (vs. unmarked), and the apical margins of the lip reflexed and wavy vs. straight with plane margins. It can be distinguished from *P. ionophlebia* by the elliptic vs. pyriform-globose pseudobulbs, the non branched vs. many-branched lines of the lip, and the smaller flowers (dorsal sepal 17 x 6 mm, petals 16 x 6-7 mm, lip, 15-16 x 15-16 mm vs. dorsal sepal 22-26 x 8-11 mm, petals 20-23 x 10-13 mm, lip 20-23 x 22-28 mm).

Distribution. Available records confirm its presence in El Salvador, Nicaragua and Mexico.

Studied specimens. Mexico: Oaxaca: Distrito de Jamiltepec, 1050 m, *M. A. Soto* 7226, AMO, drawing! El Salvador: Cumbre del Bálsamo, atrás de Jayaque, 474-1100 m, *F. Hamer 39*, SEL, drawing! Nicaragua: Madriz: *Karremans 1512*, JBL-Spirit!; Nueva Segovia: *Karremans 1539,* JBL-Spirit! Without collecting data: *Karremans 1119,* JBL-Spirit! *Karremans 2362,* JBL-Spirit!

Ecology. Epiphytic in the dry forests and open areas of intermediate height, between 600 and 1000 meters of elevation. Flowering occurs at least from March to June.

Conservation status. Data deficient.

THE COCKLE-SHELL PROSTHECHEAS. The genus *Prosthechea* suffered great taxonomic changes in the last years, and several discrete genera have been split from it (Withner & Harding, 2004). However, in view of the quite poor generic delimitations of the newly proposed taxa, I prefer to adopt here a broad concept of *Prosthechea.* The genus includes the so called "cockle shell" orchids (alternatively included into *Anacheilium* Hoffmanns.), which are the main object of this paper. Morphologically, *P. madrensis* is closely related to a small group of species ranging from Mexico to Venezuela, which in Central America and Mexico include *P. chacaoensis* (with the widest distribution), *P. ionophlebia,* and *P. radiata* (Lindl.) W.E. Higgins (the oldest name in the group). Their taxonomy has been problematic and

all the species have been at some point considered synonyms of one or several of the other taxa (i.e., Ames et. al. 1936; Williams, 1946; Dunsterville & Garay, 1961; Foldats, 1970; Dressler & Pollard, 1976; Mora-Retana & Atwood, 1993; Espejo Serna & López Ferrari, 1997; Hamer, 2001; Withner & Harding, 2004).

Traditional taxonomy in this group of species has generally neglected the use of a variety of characters different from floral structure, which by themselves are insufficient to distinguish closely related species (Fig. 5). In particular, the overall patterns of the nectar guides of the lip have been mostly overlooked as distinguishing characters, even though they are generally preserved even in dried material. Nevertheless, the characteristics of these markings on the lip, which lead the pollinator to the center of the flower, are remarkably consistent within species, probably reflecting a specific role in pollination mechanisms improving efficiency in pollen reception and deposition (van der Pijl & Dodson, 1969; Dressler, 1993; Arditti, 2003; Knudsen et. al. 2006; Scopece et al. 2007; Pupulin & Karremans, 2008b).

Prosthechea chacaoensis can be recognized by its pyriform pseudobulbs, the ringent flowers, the elliptic petals sharply bent at the middle, and the suborbicular, acute, deeply concave lip with straight margins. The lip has 13-15 purple stripes on the lip, divided into five or six lateral stripes on each side and three medium stripes, all of them reaching up to 1-2 mm from lip apex (hereafter referred as "continuous); a few of the lateral stripes are regularly branched and all the line segments are born at the base of the lip (i.e., there are no disjointed stripes). The stripes are all equally thick, with the central ones straight and continuous. This species grows most likely from Mexico to Venezuela.

Prosthechea madrensis can be recognized by its ovoid-elliptic pseudobulbs, widely spreading flowers, the elliptic petals, and the suborbicular, apiculate, slightly concave (almost flattened) lip with wavy margins. The lip presents 13 (could also have 15) stripes, with the lateral ones continuous and the median ones truncate; the two outer stripes extend to about half to three fourths the length from the distal portion of the callus to the apex of lip; the central stripe has variable length, but is mostly shorter than the other two; none of the stripes are branched and they are also all equally thick. It is found at least in Mexico, El Salvador and Nicaragua, but probably also in the intermediate countries.

Prosthechea ionophlebia is distinguished by its pyriform pseudobulbs, the large flowers, with widely spreading segments, the broad petals, which have normally a broken margin near the middle, and the subreniform, concave, apiculate lip, with strongly wavy margins. The lip has 15-17 stripes, many of them strongly branched (even basally) and with several disjointed stripes (smaller and usually near the apex);

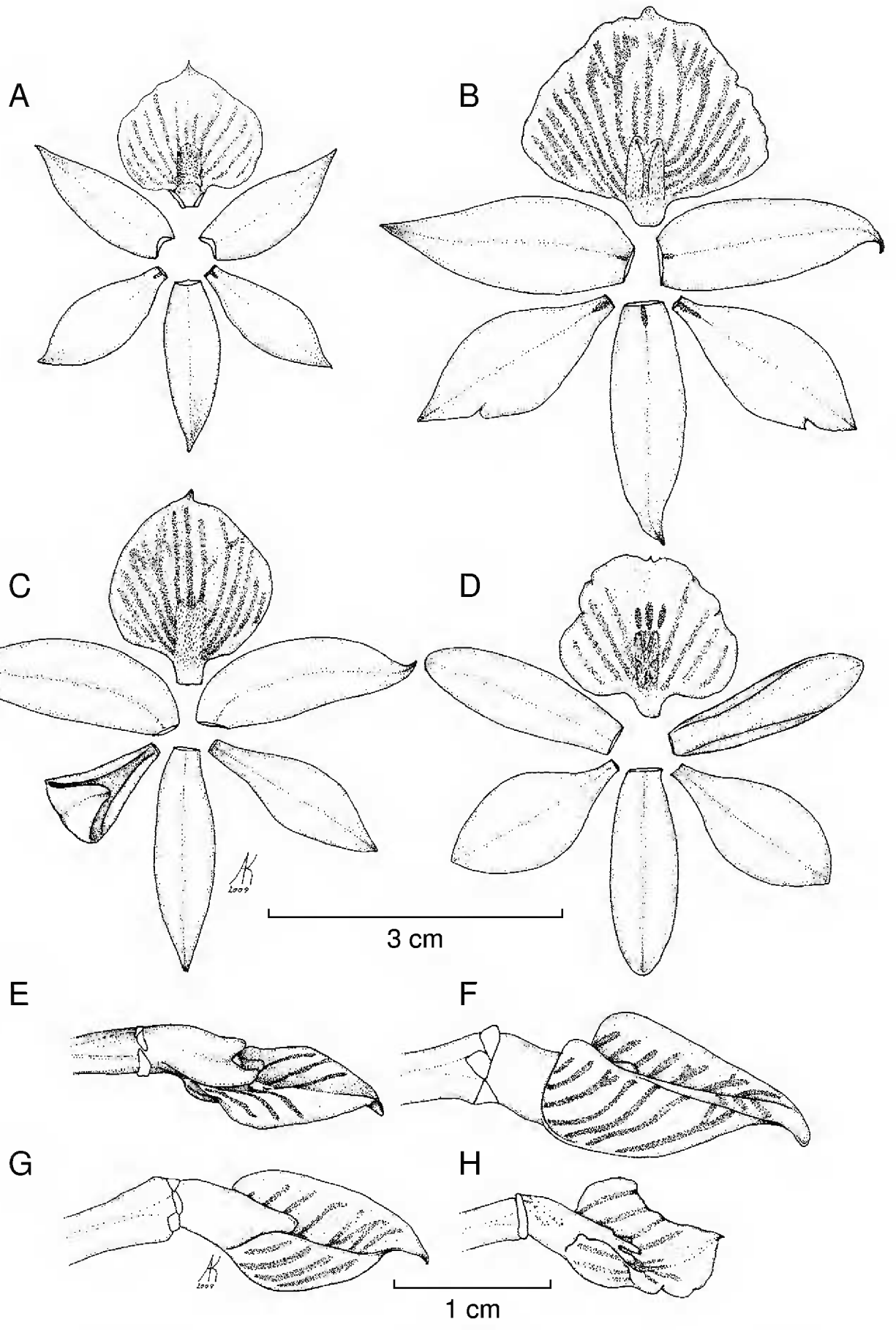

Fig. 5. A-D. Dissected perianths. A: *P. madrensis*, B: *P. ionophlebia*, C: *P. chacaoensis*, D: *P. radiata*. E-H. Column and lip, lateral view. E: *P. madrensis*, F: *P. ionophlebia*, G: *P. chacaoensis*, H: *P. radiata*. Vouchers: A and E: *Karremans 1512*; B and F: *Karremans 1275*; C and G: *Karremans 1078*; D and H: *Karremans 842*. All the vouchers at JBL-Spirit. Drawings by the author.

all the lateral stripes are continuous, but the three medium stripes are truncate, the two outermost ones reaching up half the length from the apex of callus to the apex of lip; the central line is longer but normally does not reach lip apex. All stripes have similar thickness. It is probably restricted to Costa Rica and Panama. So far all Mexican citations of the species, I have seen, actually correspond to one of the other three taxa.

Prosthechea radiata has ovoid-elliptic ridged pseudobulbs, spreading flower segments, and a slightly concave, suborbicular-ovate lip with wavy margins. It presents 11-15 stripes, the median ones much thicker; none of the stripes are branched and there are no disjointed stripes. The eight lateral stripes are continuous, but the medium ones are very short, reaching up just one third of the length between the apex of callus and lip apex. The mid-tooth of the column is much reduced. This species occurs from Mexico to Nicaragua. It is sometimes cited for Costa Rica, but I have not seen any evidence of its presence in the country.

Two other related species were published by Rudolf Schlechter: *Epidendrum hoffmannii*, which was collected by Hoffmann in Curidabad, Costa Rica, and *E. pachycarpum*, also from Costa Rica. Both species are almost indistinguishable from *Prosthechea chacaoensis*, except for the glabrous callus that Schlechter cited in the protologue of *E. pachycarpum*, a character that I have never observed in any of the related species (Pupulin & Karremans, 2007, 2008a).

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